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COMMITTEE ON THE PEACEFUL
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Scientific and Technical Subcommittee
Thirty-fourth session
Vienna, 17-28 February 1997

DRAFT REPORT OF THE SCIENTIFIC AND TECHNICAL SUBCOMMITTEE ON THE WORK OF ITS THIRTY-FOURTH SESSION

INTRODUCTION

1. The Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space held its thirty-fourth session at the United Nations Office at Vienna from 17 to __ February 1997 under the chairmanship of D. Rex (Germany).

2. Representatives of the following Member States attended the session: Argentina, Austria, Belgium, Brazil, Bulgaria, Canada, Chile, China, Colombia, Czech Republic, Ecuador, France, Germany, Greece, Hungary, India, Indonesia, Iran (Islamic Republic of), Iraq, Italy, Japan, Lebanon, Malaysia, Mexico, Morocco, Nicaragua, Nigeria, Pakistan, Peru, Philippines, Poland, Portugal, Romania, Russian Federation, South Africa, Spain, Sudan, Sweden, Syrian Arab Republic, Turkey, Ukraine, United Kingdom of Great Britain and Northern Ireland, United States of America, Uruguay, Venezuela and Viet Nam.

3. Representatives of the following specialized agencies and other organizations in the United Nations system attended the session: Food and Agriculture Organization of the United Nations (FAO), United Nations Education, Scientific and Cultural Organization (UNESCO), World Health Organization (WHO), United Nations Industrial Development Organization (UNIDO) and International Atomic Energy Agency (IAEA).

4. Representatives of the European Space Agency (ESA), Committee on Space Research (COSPAR), International Astronautical Federation (IAF), International Astronomical Union (IAU) and International Society for Photogrammetry and Remote Sensing (ISPRS) also attended the session.

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5. A list of the representatives of Member States, specialized agencies and other international organizations attending the session is contained in document A/AC.105/C.1/INF.26.

6. On 17 February 1997, the Subcommittee adopted the following agenda:

1. Adoption of the agenda.

2. Statement by the Chairman.

3. General exchange of views.

4. United Nations Programme on Space Applications and the coordination of space activities within the United Nations system.

5. Implementation of the recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space.

6. Matters relating to remote sensing of the Earth by satellites, including, *inter alia*, applications for developing countries.

7. Use of nuclear power sources in outer space.

8. Space debris.

9. Questions relating to space transportation systems and their implications for future activities in space.

10. Examination of the physical nature and technical attributes of the geostationary orbit; examination of its utilization and applications, including, *inter alia*, in the field of space communications, as well as other questions relating to space communications developments, taking particular account of the needs and interests of developing countries.

11. Matters relating to life sciences, including space medicine.

12. Progress in national and international space activities related to the Earth environment, in particular progress in the international geosphere-biosphere (global change) programme.

13. Matters relating to planetary exploration.

14. Matters relating to astronomy.

15. The theme fixed for special attention at the 1997 session of the Scientific and Technical Subcommittee: "Space systems for direct broadcasting and global information systems for space research".

16. Other matters:

(a) Advisory Committee for the preparations for a special session of the Committee, open to all Member States of the United Nations (UNISPACE III);

(b) Other reports.

17. Report to the Committee on the Peaceful Uses of Outer Space.

A. Meetings and documentation

7. The Subcommittee held __ meetings.

8. A list of the documents which were before the Subcommittee is provided in annex I to the present report.

9. Following the adoption of the agenda, the Chairman made a statement outlining the work of the Subcommittee at its current session. He also reviewed the activities of Member States in the field of space exploration, including important advances that had been achieved as a result of international cooperation during the past year.

10. At the 482nd , 485th, 487th and 488th meetings, the Chairman informed the Subcommittee that requests had been received from the permanent representatives of Bolivia, Cuba, Democratic People's Republic of Korea, Finland, Ireland, Republic of Korea, Slovakia, Thailand and United Arab Emirates, together with the League of Arab States, to attend the session. Following past practice, those delegations were invited to attend the current session of the Subcommittee and to address it as appropriate. That was without prejudice to further requests of that nature, and did not involve any decision of the Subcommittee concerning status, but was a courtesy that the Subcommittee extended to those delegations.

11. General statements were made by the following delegations: Argentina, Austria, Bolivia, Brazil, Bulgaria, Canada, Chile, China, Czech Republic, Ecuador, Germany, Hungary, India, Indonesia, Iran (Islamic Republic of), Italy, Japan, Lebanon, Mexico, Morocco, Nigeria, Pakistan, Republic of Korea, Romania, Russian Federation, Spain, Syrian Arab Republic, Turkey, United Kingdom and United States. General statements were also made by the representatives of COSPAR, IAF and ISPRS.

12. At the 482nd meeting, the Director of the Office for Outer Space Affairs made a statement reviewing the work programme of the Office. At the 485th meeting, the Expert on Space Applications made a statement outlining the activities carried out and planned under the United Nations Programme on Space Applications.

B. Technical presentations

13. In accordance with General Assembly resolution 51/123, paragraph 18 (b) (vii), of 13 December 1996, a symposium on the theme "Space systems for direct broadcasting and global information systems for space research" was organized by COSPAR and IAF to complement discussions within the Subcommittee on the special theme. The first session of the symposium, entitled "Direct broadcasting systems", was held on 17 February and was co-chaired by K. Doetsch, representing IAF, and G. Haerendel, representing COSPAR. The second session of the symposium, entitled "Global information systems for space research", was held on 18 February and was co-chaired by K. Doetsch, representing IAF, and K. Kasturirangan, representing COSPAR.

14. The presentations to the symposium included the following: "Global perspectives of satellite radio and digital audio broadcasting" by K. Kasturirangan of the Indian Space Research Organization; "Multimedia and broadcasting services via satellite" by O. Koudelka of the Technical University of Graz, Austria; "Current status of satellite direct television broadcasting in Russia" by Y. B. Zoubarev of the State Radio Research and Development Institute of the Russian Federation; "Satellite digital television broadcasting systems including the Koreasat DBS system" by J. S. Chae of the Electronic Communications Research Institute of the Republic of Korea; "International networks and satellite data archiving systems in support of Mission to Planet Earth" by R. Schiffer of the National Aeronautics and Space Administration (NASA) of the United States; "Software packages including the use of World Wide Web for research purposes in space science" by M. Machado of the National Commission for Space Activities

of Argentina; "Data and information systems on global climate change (IGBP-DIS) by J. Malingreau of the Joint Research Centre of the European Commission of International Geosphere-Biosphere Programme; and "The role of developing countries in global change and establishment of a global information system" by Zhou C. of the Chinese Academy of Science.

15. In response to General Assembly resolution 51/123, F. Alby (France), J. Bendisch (Germany), S. Toda (Japan), A. Kato (Japan), R. Crowther (United Kingdom), W. Flury of ESA and G. W. Levin of the Inter-Agency Orbital Debris Coordination Committee, made special presentations on the complex issue of space debris and the solutions currently being adopted at the national and international levels.

16. During the course of the session, scientific and technical presentations were made by K. Torkar (Austria) on the Austrian contribution to the cometary probe Rosetta; by S. Sepulveda (Chile) on research on developing medicaments for Chagas' disease through protein crystallization in microgravity conditions; by G. Brachet (France) on integrated global observation strategy; by J. Favier (France) on the scientific and technical aspects of the STS 78 mission; by Y. Matogawa (Japan) on matters relating to planetary exploration; by D. El Hadani (Morocco) on management of water resources in developing countries; by M. Kabbaj (Morocco) on space activities of developing countries: technical possibilities and perspectives; by M. Piso (Romania) on the network of space science and technology capacity building centres in central eastern and south-eastern Europe; by V. I. Lisitsin (Russian Federation) on the Mars 96 mission; by V. Nikolaev (Russian Federation) on collision of nuclear power sources (NPS) with space debris; by A. Pustovalov (Russian Federation) on NPS on board the Mars 96 spacecraft; by B. Wade (United Kingdom) on further thoughts on the revision of the NPS principles; by R. Albrecht of ESA on software packages including the use of World Wide Web for research purposes in space science; and by D. McNally of IAU on adverse environmental impacts on astronomy.

C. Recommendations of the Scientific and Technical Subcommittee

17. After considering the various items before it, the Subcommittee, at its ___ meeting, on __ February 1997, adopted its report to the Committee on the Peaceful Uses of Outer Space containing its views and recommendations as set out in the paragraphs below.

I. UNITED NATIONS PROGRAMME ON SPACE APPLICATIONS AND THE COORDINATION OF SPACE ACTIVITIES WITHIN THE UNITED NATIONS SYSTEM

II. IMPLEMENTATION OF THE RECOMMENDATIONS OF THE SECOND UNITED NATIONS CONFERENCE ON THE EXPLORATION AND PEACEFUL USES OF OUTER SPACE

18. In accordance with General Assembly resolution 51/123, the Subcommittee continued its consideration of the above-mentioned items. In accordance with past practice, the Subcommittee considered the two items jointly.

19. The Subcommittee noted that the General Assembly, in its resolution 51/123, paragraph 24, had once again emphasized the urgency and importance of implementing fully the recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE 82). The Subcommittee took note of paragraph 19 of the same resolution, in which the General Assembly considered that, in the context of the Subcommittee's consideration of that item, it was particularly urgent to implement the following recommendations:

> "(a) All countries should have the opportunity to use the techniques resulting from medical studies in space;
>
> "(b) Databases at the national and regional levels should be strengthened and expanded and an international space information service should be established to function as a centre of coordination;
>
> "(c) The United Nations should support the creation of adequate training centres at the regional level, linked, whenever possible, to institutions implementing space programmes; necessary funding for the development of such centres should be made available through financial institutions;
>
> "(d) The United Nations should organize a fellowship programme through which selected graduates or postgraduates from developing countries should get in-depth, long-term exposure to space technology or applications; it is also desirable to encourage the availability of opportunities for such exposure on other bilateral or multilateral bases outside the United Nations system."

20. In response to the recommendations of the Working Group of the Whole to Evaluate the Implementation of the Recommendations of UNISPACE 82, contained in its report on the work of its tenth session, held in 1996 (A/AC.105/637 and Corr.1, annex II, paras. 7-44), which were endorsed by the General Assembly in resolution 51/123, paragraph 20, the Subcommittee had before it the following documents: a report on international cooperation in the peaceful uses of outer space: activities of Member States (A/AC.105/661 and Add.1 and 2), containing information submitted by Member States in response to paragraph 9 of the report of the Working Group of the Whole; a note by the Secretariat containing a summary of a study on basic space science in developing countries (A/AC.105/664), prepared pursuant to paragraph 4 (c) of the report of the Working Group; and a note by the Secretariat to which was annexed a study on the use of new technologies in satellite communications and information networks (A/AC.105/665), prepared pursuant to paragraph 11 (b) of the report of the Working Group of the Whole. In addition, the Subcommittee had before it annual reports that included information submitted by the following international organizations in response to paragraph 10 of the report of the Working Group of the Whole: European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) (A/AC.105/670), ESA (A/AC.105/653), European Telecommunications Satellite Organization (EUTELSAT) (A/AC.105/652) and International Telecommunications Satellite Organization (INTELSAT) (A/AC.105/651).

21. In accordance with General Assembly resolution 51/123, paragraph 21, the Subcommittee reconvened the Working Group of the Whole with a view to improving the execution of activities relating to international

cooperation, particularly those included in the United Nations Programme on Space Applications, and to proposing concrete steps to increase such cooperation as well as to make it more efficient. The Working Group of the Whole was chaired by Muhammed Nasim Shah (Pakistan); it held ___ meetings between 19 and __ February 1997 and adopted its report on __ February 1997.

22. Having considered the report of the Working Group of the Whole, the Subcommittee decided at its __th meeting, on __ February 1997, to adopt that report, as contained in annex II to the present report, on the understanding that the recommendations contained therein would be carried out in accordance with paragraph 9 of General Assembly resolution 37/90 of 10 December 1982. The Subcommittee recommended that the Working Group of the Whole should be reconvened in 1998 to continue its work.

A. United Nations Programme on Space Applications

23. Regarding the expanded United Nations Programme on Space Applications, the Subcommittee had before it the report of the United Nations Expert on Space Applications (A/AC.105/660 and Add.1). The report was supplemented by a statement by the Expert. The Subcommittee noted that the United Nations Programme on Space Applications for 1996 had been carried out satisfactorily and commended the work accomplished by the Expert in that regard.

24. The Subcommittee noted with appreciation that, since its previous session, additional contributions had been offered by various Member States and organizations and that they had been acknowledged in the report of the Expert (A/AC.105/660 and Add.1, paras. 34-35).

25. The Subcommittee continued to express its concern over the still limited financial resources available for carrying out the Programme and appealed to Member States to support the Programme through voluntary contributions. The Subcommittee felt that the limited resources of the United Nations should be focused on the activities with the highest priority and noted that the United Nations Programme on Space Applications was the priority activity of the Office for Outer Space Affairs.

1. 1996-1997

United Nations conferences, training courses, workshops, expert meetings and symposia

26. With regard to the activities of the Programme carried out in 1996 and early in 1997, the Subcommittee expressed its appreciation to the following:

(a) The Government of the United States for co-sponsoring the United Nations/United States of America International Conference on Spin-off Benefits of Space Technology: Challenges and Opportunities, held at Colorado Springs, Colorado, from 9 to 12 April 1996;

(b) The Government of the Philippines, as well as ESA, for co-sponsoring the United Nations/European Space Agency Workshop on Microwave Remote Sensing Applications, hosted by the National Mapping and Resource Information Authority of the Philippines and held at Manila from 22 to 26 April 1996;

(c) The Government of Sweden, represented by the Swedish International Development Agency, for co-sponsoring the Sixth United Nations International Training Course on Remote Sensing Education for Educators, hosted by the Department of Physical Geography of Stockholm University and the Swedish Space Corporation and held at Stockholm and Kiruna from 6 May to 15 June 1996;

(d) The Government of Chile, as well as ESA, for co-sponsoring the United Nations/Chile/European Space Agency Regional Workshop on Space Technology to Prevent and Mitigate the Effects of Disasters, hosted by the Ministerio de Relaciones Exteriores, the Oficina Nacional de Emergencia del Ministerio del Interior, the Comité de Asuntos Espaciales de Chile and the Fuerza Aérea de Chile and held at Santiago from 1 to 5 July 1996;

(e) The Government of Austria, as well as the province of Styria, the city of Graz, the European Commission and ESA, for co-sponsoring the United Nations/European Space Agency/European Commission Symposium on Space Technology Applications for the Benefit of Developing Countries, held at Graz from 9 to 12 September 1996;

(f) The Government of Germany, as well as ESA, for co-sponsoring the Sixth United Nations/European Space Agency Workshop on Basic Space Science, hosted by the German Space Agency (DARA) at the Max Planck Institute for Radio Astronomy and held at Bonn from 9 to 13 September 1996;

(g) The Government of Spain, as well as ESA, for co-sponsoring the United Nations/Instituto Nacional de Técnica Aeroespacial/European Space Agency International Conference on Small Satellites: Missions and Technology, hosted by the Instituto Nacional de Técnica Aeroespacial and held at Madrid from 9 to 13 September 1996;

(h) The Government of China, IAF and ESA, for co-sponsoring the United Nations/International Astronautical Federation Workshop on Education and Awareness: Space Technology and Applications in the Developing World, held at Beijing from 3 to 6 October 1996;

(i) The Government of South Africa for co-sponsoring the Second United Nations Regional Conference on Space Technology for Sustainable Development in Africa, held at Pretoria from 4 to 8 November 1996;

(j) The Government of India, as well as ESA, for co-sponsoring the United Nations/European Space Agency Workshop on Satellite Communications, hosted by the Government of India in cooperation with the Centre for Space Science and Technology Education in Asia and the Pacific and held at Ahmedabad from 20 to 24 January 1997;

(k) The Government of Austria for sponsoring, in cooperation with the United Nations, the United Nations Seminar on Space Futures and Human Security, hosted by the Austrian Federal Ministry of Foreign Affairs and the province of Tyrol and held at Alpbach from 27 to 30 January 1997.

27. The Subcommittee took note of the status of United Nations workshops, training courses, symposia and conferences planned for 1997, including the following described in the report of the Expert on Space Applications (A/AC.105/660 and Add.1, annex V):

(a) Second United Nations/United States of America International Conference on Spin-off Benefits of Space Technology: Challenges and Opportunities, being organized in cooperation with the Government of the United States, to be held at Colorado Springs, Colorado, in October 1997;

(b) Seventh United Nations/International Training Course on Remote Sensing Education for Educators, being organized in cooperation with the Government of Sweden, to be held at Stockholm and Kiruna from 5 May to 13 June 1997;

(c) Seventh United Nations/European Space Agency Workshop on Basic Space Science, being organized in cooperation with the Government of Honduras, to be held at Tegucigalpa from 16 to 20 June 1997;

(d) United Nations/European Space Agency workshop on the cooperative information network linking scientists, educators, professionals and decision makers in Africa (COPINE), to be held in Africa in the second or third quarter of 1997;

(e) United Nations/European Space Agency Symposium on Space Industry Cooperation with the Developing World, being organized with the Government of Austria, the province of Styria, the city of Graz and ESA, to be held at Graz from 8 to 11 September 1997;

(f) United Nations/Committee on Space Research Workshop on Data Analysis Techniques, being organized in cooperation with the Government of Brazil and the Centre for Space Science and Technology Education in Latin America and the Caribbean, to be held in Brazil in September or October 1997;

(g) Fourth United Nations/European Space Agency Training Course on Applications of the European Remote Sensing Satellite Data for English-speaking African countries, to be held at Frascati, Italy, in October 1997;

(h) United Nations International Workshop on Satellite Communications Technology for Capacity-building, being organized in cooperation with the Government of Israel, to be held at Haifa from 21 to 25 September 1997;

(i) United Nations/International Astronautical Federation Workshop on Space Technology as a Cost-Effective Tool to Improve Infrastructure in Developing Countries, being co-sponsored by ESA and the European Commission and organized in cooperation with the Government of Italy, to be held at Torino from 2 to 5 October 1997;

(j) Second United Nations Seminar on Space Futures and Human Security, to be held in the province of Tyrol in December 1997 and/or January 1998.

Long-term fellowships for in-depth training

28. The Subcommittee expressed appreciation to ESA for having offered five training fellowships in various areas relating to space activities for the period 1996-1997. The status of the fellowships for the period 1996-1997 and the countries whose candidates had received fellowships were indicated in the report of the Expert (A/AC.105/660 and Add.1, annex II).

29. The Subcommittee noted that it was important to increase the opportunities for in-depth education in all areas of space science, technology and applications projects through long-term fellowships.

Technical advisory services

30. The Subcommittee took note of the technical advisory services being provided under the United Nations Programme on Space Applications in support of projects on regional space applications, as indicated in the report of the Expert (A/AC.105/660 and Add.1, paras. 16-28):

(a) Assistance to the Government of Uruguay in its follow-up, as *pro tempore* secretariat, of the recommendations of the Third Space Conference of the Americas;

(b) Assistance to the Government of the Republic of Korea in the growth and operation of the Asia-Pacific Satellite Communications Council;

(c) Collaboration with several African countries on the implementation of the COPINE project in order to address one of the recommendations of the United Nations Regional Conference on Space Technology for Sustainable Development in Africa, held at Dakar from 25 to 29 October 1993, regarding the urgent need to establish an efficient communications network among African and European professionals and scientists at the national, continental and intercontinental levels;

(d) Collaboration with ESA and the Department for Development Support and Management Services of the Secretariat in follow-up activities related to the recommendations of the training courses on applications of the European Remote Sensing Satellite data to natural resources, renewable energy and the environment held at Frascati, Italy, in 1993, 1994 and 1995;

(e) Collaboration with ESA on follow-up activities relating to the series of workshops on basic space science;

(f) Elaboration of an inter-agency project proposal on a satellite-based disaster warning broadcasting system for small island developing States.

Promotion of greater cooperation in space science and technology

31. The Subcommittee noted that the United Nations was collaborating with international professional bodies in the space community to promote the exchange of experiences on space activities. The United Nations Programme on Space Applications had co-sponsored the United Nations/IAF/ESA Workshop on Education and Awareness: Space Technology and Applications in the Developing World, held at Beijing in October 1996 in conjunction with the 47th IAF Congress. Participants at the Workshop also attended the Congress. The Subcommittee noted that in 1996 the Programme had co-sponsored the participation of scientists from developing countries in the Thirty-First Scientific Assembly of COSPAR, held at Birmingham, United Kingdom, from 14 to 21 July 1996.

32. The Subcommittee noted that in 1997, the Programme would co-sponsor the participation of scientists from developing countries in the United Nations/IAF Workshop to be co-sponsored by ESA and EC on Space Technology as a Cost-Effective Tool to Improve Infrastructures in Developing Countries, to be held at Torino, Italy, from 2 to 5 October 1997 in conjunction with the 48th IAF Congress, and that participants at the Workshop would also attend the IAF Congress to be held from 6 to 10 October 1997.

2. 1998

United Nations conferences, training courses, workshops and symposia

33. The Subcommittee recommended the approval of the following programme of conferences, training courses, workshops and symposia proposed for 1998 which, with the exception of item (a), would be used as preparatory meetings for the UNISPACE III Conference:

(a) Eighth United Nations International Training Course on Remote Sensing Education for Educators;

(b) United Nations/European Space Agency Regional Meeting on Space Technology and Applications for Development (with emphasis on microwave remote sensing applications and including preparations for the UNISPACE III Conference), Malaysia, Asia and the Pacific;

(c) United Nations Regional Conference for Decision Makers on Space Technology Development (including preparations for the UNISPACE III Conference), Africa;

(d) United Nations Regional Meeting on Space Technology and Applications for Development (with emphasis on information technology and including preparations for the UNISPACE III Conference), Latin America and the Caribbean;

(e) United Nations/Austria Symposium on Economic Benefits of Applying Space Systems in Support of Resources Planning, Education and Communication Infrastructure (including preparations for the UNISPACE III Conference), Graz, Austria;

(f) The Third United Nations Regional Conference on Spin-off Benefits of Space Technology (Asia/Caribbean);

(g) United Nations/IAF Workshop on Expanding the User Community of Space Technology in Developing Countries, Melbourne, Australia;

(h) United Nations Third Seminar on Space Futures and Human Security, province of Tyrol, Austria.

B. International space information service

34. The Subcommittee noted with satisfaction that the Office for Outer Space Affairs had continued to develop a World Wide Web home page, including both information within the United Nations system and access to external databases.

35. The Subcommittee noted with satisfaction the publication of documents entitled *Seminars of the United Nations Programme on Space Applications: Selected Papers on Space Science Education, Remote Sensing and Small Satellites* (A/AC.105/650) and *Education, Training, Research and Fellowship Opportunities in Space Science and Technology and Its Applications: A Directory* (A/AC.105/671).

C. Reports

36. The Subcommittee took note with appreciation of the reports submitted to it by Member States and international organizations in response to the recommendations of the Working Group of the Whole in its report on the work of its ninth session. It also noted with satisfaction that the Secretariat had prepared studies on basic space science in developing countries (A/AC.105/664) and the use of new technologies in satellite communications and information networks (A/AC.105/665).

D. Coordination of space activities within the United Nations system and inter-agency cooperation

37. The Subcommittee noted that the General Assembly, in its resolution 51/123, had invited all Governments within the organizations of the United Nations system and other intergovernmental organizations working in the field of outer space or on space-related matters to take effective action for the implementation of the recommendations of UNISPACE 82.

38. The Subcommittee continued to stress the necessity of ensuring continuous and effective consultations and coordination in the field of outer space activities among organizations within the United Nations system and the avoidance of duplication of activities. The Subcommittee noted that the sessions of the Inter-Agency Meeting on Outer Space Activities are to be convened at the United Nations Office at Vienna, and hosted by the Office for Outer Space Affairs, prior to the sessions of the Committee each year, without prejudice to any invitation by an interested agency to host a session at its headquarters. The Subcommittee noted with satisfaction that the Inter-Agency Meeting on Outer Space Activities was scheduled to be held at the United Nations Office at Vienna, from 28 to 30 May 1997.